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(54) Non-foamable gel shaving composition

(57) A non-foamable gel shaving composition comprises the following components (A), (B) and (C): (A) from 0.1% by weight to 5.0% by weight of a carboxyvinyl polymer or a copolymer of acrylic acid and alkyl methacrylate; (B) from 0.005% by weight to 2.0% by weight of a high-polymeric polyethylene oxide having a number average molecular weight of 100,000 or more; and (C) the balance being water. This shaving composition can well soften the mustache or skin, has a superior razor slipperiness, does not cause a rash, makes it possible to shave several times at the same area of the skin, and also can impart a good feel to users after washing.

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## NON-FOAMABLE GEL SHAVING COMPOSITION

BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to a shaving composition used in shaving off mustache or undesired hair with safety razors, common razors, etc. (hereinafter generally referred to as "razors")

## 2. Description of the Related Art

It is commonly known that mustache or undesired hair can be efficiently shaven when water comes in contact with the mustache or skin and permeates thereinto so as to lower the shear force of the mustache and soften the skin to be shaven. When merely applied to the mustache or skin, however, the water would soon fall in drops due to the insufficient adhesion to the mustache or skin. Thus a problem may arise such that the mustache or skin can not be sufficiently softened. In addition, there is another problem that a razor shows only a poor slipperiness on the skin.

Accordingly, as conventionally done, a solid or powder soap is dissolved in water and foamed therein with hands, a rush, etc. and the foam having thus improved shape retention is applied to the mustache

and skin followed by shaving. However, this procedure causes a problem that the foam obtained from a soap may liquefy with time because of its poor retention, and thus fall in drops, thus failing to sufficiently soften the mustache or skin. Moreover, such a soap must be foamed every time when shaving, which brings about another problem of being inconvenient.

To solve these problems, there have been developed shaving foam aerosol products and "post-foamable" shaving gel aerosol products having been improved in foam shape retention and convenience in use. Such a shaving foam aerosol product is composed of a water-containing shaving foam stock solution comprising a soap and other surfactants and is packed together with a liquefied gas (i.e., a propellant) in a pressure container. The shaving gel aerosol product is composed of a shaving gel comprising a foaming agent (e.g., isopentane) solubilized in a mixture of water, a gelling agent (e.g., hydroxyethyl cellulose or hydroxypropylmethyl cellulose) and a soap (a surfactant) and is packed in the inner bag of a double-wall pressure container having a compressed gas injected between the inner bag and the outer can.

However, these conventional shaving foam aerosol products involves a problem that the mustache or skin

can be sufficiently softened with difficulty, since the foam thus formed mainly comprises gases and, therefore, the amount of water coming in contact with the mustache or skin is seriously reduced relatively. As a result, some troubles may arise such that the insufficient slipperiness of a razor makes the horny layer peel off or causes a rash (congestion of blood, a smart, etc.). An additional disadvantage of such a product resides in that, since it contains a soap as a surfactant, the skin becomes not moist or smooth but stiff after washing with water.

With regard to the shaving foam products, it is also sought to make it possible to shave several times at the same area of the skin.

#### SUMMARY OF THE INVENTION

The present invention aims at solving these problems encountering in the prior art. Accordingly, an object of the present invention is to provide a shaving composition which can sufficiently soften the mustache or skin and improve the slipperiness of a razor, causes no rash, imparts a good feel after washing, and also makes it possible to shave several times at the same area of the skin.

The present inventor has discovered that the above object can be achieved when a water-containing

non-foamable gel shaving composition is prepared by using i) as a gelling agent a carboxyvinyl polymer or a copolymer of acrylic acid and alkyl methacrylate and ii) a high-polymeric polyethylene oxide having a number average molecular weight of 100,000 or more, which are used in combination in a specific proportion; thus having accomplished the present invention.

More specifically, the present invention provides a non-foamable gel shaving composition comprising the following components (A), (B) and (C):

(A) from 0.1% by weight to 5.0% by weight of a carboxyvinyl polymer or a copolymer of acrylic acid and alkyl methacrylate;

(B) from 0.005% by weight to 2.0% by weight of a high-polymeric polyethylene oxide having a number average molecular weight of 100,000 or more; and

(C) ~~the balance being~~ water.

Preferably the composition comprises at least 80% by weight of water, more preferably at least 90% by weight of water and most preferably at least 96% by weight of water based upon the composition as a whole. The composition may optionally include one or more different additives such as a polyhydric alcohol, a pH adjuster, a surfactant, an oily substance, an anti-inflammatory agent, a preservative, a solubilizer, a viscosity modifier, an antioxidant, an ultra-violet absorbent, a germicide, a colourant or a perfume. Accordingly, whilst the aqueous non-foamable gel shaving composition comprises at least the components (A) and (B) as well as water as essential components, it is also possible for one or more additional components to be present.

This and other objects, features and advantages of the present invention are described in or will become apparent from the following detailed description of the invention.

#### DETAILED DESCRIPTION OF THE INVENTION

The present invention will be described below in detail.

In the shaving composition of the present invention, a component-(A) carboxyvinyl polymer or copolymer of acrylic acid and alkyl methacrylate and a component-(B) high-polymeric polyethylene oxide are used. These are used in combination for the reasons shown below.

The component-(A) carboxyvinyl polymer or copolymer of acrylic acid and alkyl methacrylate can form a water-holdable gel having a good shape retention. When applied to the skin or hair, such a water-holdable gel can well hold water content in it, and also can impart a comfortable feel to users as being free of stickiness to the skin. However, the water-holdable gel comprising a carboxyvinyl polymer or a copolymer of acrylic acid and alkyl methacrylate has an insufficient salt resistance. Hence, when applied to unwashed skin to which salt components originating from sweat have adhered in a large quantity, its viscosity may abruptly decrease to become held on the mustache or skin with difficulty. It has such a disadvantage. This water-holdable gel also has a disadvantage that it may undesirably be removed with ease from the skin surface upon one stroke of shaving although it is sought in usual shaving to shave several times at the same area of the

skin. Accordingly, especially in the case when the water-holdable gel comprising the component-(A) carboxyvinyl polymer or copolymer of acrylic acid and alkyl methacrylate is applied to a dried mustache or skin, one can shave with difficulty and also an insufficient razor slipperiness may result to make the horny layer peel off or may cause a rash (congestion of blood, a smart, etc.).

On the other hand, the component-(B) high-polymeric polyethylene oxide has a good salt resistance and has a superior adhesion to the skin. It also can improve the razor slipperiness to make the skin withstand when shaving several times at the same area. It, however, has no sufficient shape retention to cause a problem that it falls in drops when applied to the skin.

Accordingly, when the component-(A) carboxyvinyl polymer or copolymer of acrylic acid and alkyl methacrylate and the component-(B) high-polymeric polyethylene oxide are used in combination to prepare a non-foamable gel shaving composition, it is assumed that the disadvantages of the both come out. Herein, what is meant by "non-foamable" is that the shaving composition does not foam even in an attempt to form it into an aerosol by the use of a propellant, in an



attempt to cause it foam by a mechanical means or in an attempt to rub it with hands to foam.

However, according to findings made by the present inventor, unexpectedly a non-foamable gel shaving composition having a good shape retention can be obtained when both the components are used in combination in a specific proportion, and also the composition thus obtained can well soften the mustache or skin, has a superior razor slipperiness, causes no rash, makes it possible to shave the skin several times at its same area, and also imparts a good feel after washing. Based on such findings, in the present invention, the component-(A) carboxyvinyl polymer or copolymer of acrylic acid and alkyl methacrylate and the component-(B) high-polymeric polyethylene oxide are used in combination in a specific proportion.

The component-(A) carboxyvinyl polymer may include water-soluble vinyl polymers having carboxyl groups, as exemplified by polymers having a structure represented by Formula (1):

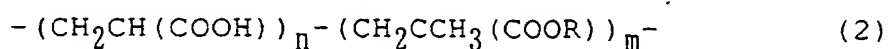


wherein n is a number of from 5,000 to 60,000.

Stated specifically, it is possible to use those

specified by trade names CARBOPOL 940, CARBOPOL 941, etc. (available from B.F. Goodrich).

The component-(A) copolymer of acrylic acid and alkyl methacrylate may include copolymers having a structure represented by Formula (2):



wherein R is an alkyl group, and preferably a alkyl group having 8 to 30 carbon atoms; and n and m are each a number of from 1,000 to 60,000.

Stated specifically, it is possible to use those specified by trade names PEMULEN TR-1, PEMULEN TR-2, etc. (available from B.F. Goodrich).

The component-(A) carboxyvinyl polymer or copolymer of acrylic acid and alkyl methacrylate is mixed in the shaving composition in an amount of from 0.1 to 5.0% by weight, and preferably from 0.2 to 1.0% by weight. If it is in an amount less than 0.1% by weight, the shaving composition may have an insufficient shape retention. If it is in an amount more than 5.0% by weight, the shaving composition can be spread with difficulty when applied, also tends to cause the gap of a double-blade razor to clog, and still also can be washed off with difficulty.

The non-foamable gel shaving composition of the present invention contains a high-polymeric polyethylene oxide as the component-(B). This high-polymeric polyethylene oxide has a number average molecular weight of 100,000 or more, and preferably from 2,000,000 to 4,000,000. If it has a number average molecular weight less than 100,000, an insufficient razor slipperiness may result. The component-(B) high-polymeric polyethylene oxide is mixed in the shaving composition in an amount of from 0.005 to 2.0% by weight, and preferably from 0.01 to 0.5% by weight. If it is in an amount less than 0.005% by weight, the razor slipperiness can not be well effectively improved. If it is in an amount more than 2.0% by weight, the razor may slip over the skin to make it difficult to shave deep, and also the shaving composition tends to cause the gap of a double-blade razor to clog and can be washed off with difficulty. Moreover, it may become sticky or adhesive, resulting in a poor feel when used.

In addition to the above components (A) and (B), the non-foamable gel shaving composition of the present invention contains water in an amount being the balance. This water is a component for making the mustache or skin soft.

The non-foamable gel shaving composition of the present invention may preferably have a Brookfield viscosity (30°C) of from 1,000 to 70,000 cP, and more preferably from 10,000 to 40,000 cP. This is because a composition with a viscosity less than 1,000 cP may excessively adhere to the mustache or skin and a composition with a viscosity more than 70,000 cP can be spread on the mustache or skin with difficulty and also may make the razor slip over the skin. The Brookfield viscosity can be measured using a B-type rotational viscometer (T-A type rotor/ 5 rpm /60 sec).

The non-foamable gel shaving composition of the present invention may preferably further contain a polyhydric alcohol as component-(D). This makes it possible to prevent the skin from drying immediately after shaving with a razor upon application of the gel shaving composition to the skin, and to keep the skin appropriately wet. Hence, it becomes easy to shave several times at the same area of the skin. Further, the use of a polyhydric alcohol can improve the compatibility of the present composition with the skin and the spreadability thereof on the skin, and can furthermore make the skin moist and comfortable in feeling after use.

Such a polyhydric alcohol may include sorbitol,

glycerol, propylene glycol, 1,3-butylene glycol, diglycerol, dipropylene glycol, polypropylene glycol, and polyethylene oxides having a molecular weight of less than 100,000.

The polyhydric alcohol may be mixed in the shaving composition in an amount of from 0.01 to 5.0% by weight, and preferably not more than 2.0% by weight, because, if it is in a too small quantity, the skin can not be well wetted, and, if it is in a too large quantity, the shaving composition can be washed off with difficulty and also the skin may become sticky after washing. When such a polyhydric alcohol is mixed in the non-foamable gel shaving composition, one type of polyhydric alcohol may be mixed alone or two or more types may be mixed in combination.

To the non-foamable gel shaving composition of the present invention, a pH adjuster (or a neutralizer) to adjust a pH and/or a viscosity of the composition may optionally be added which is commonly used in cosmetics. Examples of such a pH adjuster includes basic compounds such as sodium hydroxide, potassium hydroxide, triethanolamine. By adjusting a viscosity of the composition, not only the shape retention but also the spreadability of the present composition can be improved.

The non-foamable gel shaving composition of the present invention may be optionally further appropriately mixed with surfactant(s) and oily substance(s) which are commonly used in cosmetics. The mixing of these components can make the skin moist after shaving using the shaving composition. Also, this is useful for skin care after shaving.

Such a surfactant may include nonionic surfactants, anionic surfactants and amphoteric surfactants, one or more of which may be used alone or in combination.

The nonionic surfactants may include, e.g., polyoxyethylene hardened castor oil; polyoxyethylene addition type surfactants as exemplified by polyoxyethylene sorbitan fatty esters such as polyoxyethylene sorbitan monostearate and polyoxyethylene sorbitan tetraoleate, polyoxyethylene glyceryl fatty esters such as polyoxyethylene glyceryl monoisostearate and polyoxyethylene glyceryl triisostearate, polyethylene glycol fatty esters such as polyethylene glycol monoisostearate, and polyoxyethylene alkyl ethers such as polyoxyethylene hexyl decyl ether, polyoxyethylene octyl dodecyl ether, polyoxyethylene lauryl ether, polyoxyethylene cetyl ether, polyoxyethylene stearyl ether, polyoxyethylene

oleyl ether and polyoxyethylene nonyl phenyl ether; polyglycerol type surfactants such as polyglycerol alkyl ethers and polyglycerol fatty esters; and silicone derivative surfactants such as a polyoxyethylene methylpolysiloxane copolymer and a poly(oxyethylene-oxypropylene) methylpolysiloxane copolymer.

The anionic surfactants may include, e.g., polyoxyethylene alkyl sulfates such as polyoxyethylene lauryl ether sodium sulfate and polyoxyethylene lauryl ether sulfate triethanolamine; N-acylamino acid salts such as lauroylsarcosine sodium salt and lauroyl methylalanine sodium salt; and polyoxyethylene alkyl ether phosphates such as polyoxyethylene lauryl ether sodium phosphate, polyoxyethylene cetyl ether sodium phosphate, dipolyoxyethylene alkyl ether phosphates, tripolyoxyethylene alkyl ether phosphates, dipolyoxyethylene nonyl phenyl ether phosphate and dipolyoxyethylene lauryl ether sodium phosphate.

The amphoteric surfactants may include, e.g., alkylbetaines, alkylamidobetaines and alkylsulfobetaines.

As the oily substance, there are no particular limitations thereon so long as they are not irritant to the skin, and those similar to base materials

conventionally used in cosmetics and external remedies may be used. For example, they may include hydrocarbons such as vaseline, ceresin, solid paraffin, liquid paraffin and squalane; natural animal and vegetable fats and oils such as olive oil, jojoba oil, lanolin, castor oil, cacao oil and mink fat; synthetic ester oils such as octyldodecyl myristate, isopropyl myristate and isopropyl palmitate; silicone derivatives such as dimethylpolysiloxane and methylphenylpolysiloxane; amide derivatives such as ceramide; higher alcohols; and intercellular lipids such as cholesterol and ceramide.

When the oily substance is mixed in the shaving composition, it may preferably be mixed in the form of an emulsion which is an oil-in-water type emulsion prepared by a conventional method using the oily substance, the surfactant described above and purified water. This can improve the skin care effect.

To the non-foamable gel shaving composition of the present invention, other additives commonly used in cosmetics may be appropriately added, as exemplified by anti-inflammatory agents such as dipotassium glycyrrhizinate, preservatives such as parahydroxybenzoates and sodium benzoate, solubilizers such as polyoxyethylene hardened castor oil, viscosity



modifiers such as ethylene glycol fatty ester and dextrin fatty ester, antioxidants such as dibutylhydroxytoluene, ultraviolet absorbents such as oxybenzosulfonic acid, germicides such as triclosan and trichlorocarben, coloring matters, and perfumes.

In the present invention, it is preferable not to use as surfactants any soaps that may generally irritate the skin and also make the skin stiff after washing.

The non-foamable gel shaving composition of the present invention can be produced by conventional methods. For example, it can be produced by adding the component-(A) carboxyvinyl polymer and the component-(B) high-polymeric polyethylene oxide in the component-(C) water, optionally together with the component (D) polyhydric alcohol and other additives, followed by stirring homogeneously. When it is required to adjust a viscosity and/or a pH of the composition, a pH adjuster such as sodium hydroxide may be preferably added in the component-(C) water, together with the other components.

As specific forms of products, the non-foamable gel shaving composition of the present invention may be packed in tubes or bottles, or may be packed in double-wall pressure containers as in the case of

conventional post-foamable shaving foam aerosol products.

As described above, in the non-foamable gel shaving composition of the present invention, the component-(A) carboxyvinyl polymer and the component-(B) high-polymeric polyethylene oxide are added to the component-(C) water to form a gel. Thus, the component-(A) carboxyvinyl polymer and the component-(B) high-polymeric polyethylene oxide compensate for their disadvantages each other so that the advantages of these components can be effectively utilized. Hence, the non-foamable gel shaving composition of the present invention can sufficiently soften the mustache or skin and improve the razor slipperiness, causes no rash, makes it possible to shave several times at the same area of the skin, and also can impart a good feel after washing.

#### EXAMPLES

The present invention will be described below in greater detail by giving Examples.

##### Examples 1 and Comparative Examples 1 to 8

Non-foamable gel shaving compositions formulated as shown in Tables 1 and 2 were produced by the conventional method.

- Evaluation -

Using the non-foamable gel shaving compositions of Example 1 and Comparative Examples 1 to 8, 10 male adult panelists shaved, and organoleptically evaluated "razor slipperiness", "rash", "rinsing performance", "blade clogging" and "shape retention" in accordance with the following criteria. Results obtained are shown in Tables 1 to 2.

In actual shaving, each panelist washed his face and, after wiping and drying with a towel, applied the shaving composition to the mustache with hands under thermo-hygrostat conditions (20°C, 65%RH), followed by shaving with a double-blade safety razor.

#### Criteria

##### (1) Razor slipperiness:

<u>Rank</u>	<u>Estimation</u>
-------------	-------------------

A: 7 or more panelists estimated that the sample was well slippery.

B: 4 to 6 panelists estimated that the sample was well slippery.

C: 3 or less panelists estimated that the sample was well slippery.

##### (2) Rash:

<u>Rank</u>	<u>Estimation</u>
-------------	-------------------

A: 7 or more panelists estimated that the sample caused little rash.

B: 4 to 6 panelists estimated that the sample caused little rash.

C: 3 or less panelists estimated that the sample caused little rash.

(3) Rinsing performance:

<u>Rank</u>	<u>Estimation</u>
-------------	-------------------

A:	7 or more panelists estimated that the sample was readily rinsed away with water.
----	---

B: 4 to 6 panelists estimated that the sample was readily rinsed away with water.

C: 3 or less panelists estimated that the sample was readily rinsed away with water.

(4) Blade clogging:

<u>Rank</u>	<u>Estimation</u>
-------------	-------------------

A:	7 or more panelists estimated that the sample caused little blade clogging.
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B: 4 to 6 panelists estimated that the sample caused little blade clogging.

C: 3 or less panelists estimated that the sample caused little blade clogging.

(5) Shape retention:

<u>Rank</u>	<u>Estimation</u>
-------------	-------------------

A:	7 or more panelists estimated that the sample scarcely fell from the skin in drops.
----	---

B: 4 to 6 panelists estimated that the sample

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scarcely fell from the skin in drops.

C: 3 or less panelists estimated that the sample scarcely fell from the skin in drops.

Table 1

Components	Example				Comparative Example				(wt.%)
	1	2	3	4	1	2	3	4	
Carboxyvinyl polymer*1	0.70	-	-	0.70	-	-	-	-	0.70
High-polymeric polyethylene oxide*2	0.30	-	0.30	-	-	0.30	-	-	-
Polyethylene oxide*3	-	-	-	0.30	-	-	0.30	0.30	0.30
Aqueous 48% NaOH solution	0.43	-	-	0.43	0.43	-	-	-	0.43
Purified water	98.57	99.70	99.70	98.57	98.87	99.70	99.70	98.57	98.57
Total:	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Evaluation

(1) Razor slipperiness	A	C	A	C	C	C
(2) Rash	A	C	A	C	C	C
(3) Rinsing performance	A	A	A	A	A	A
(4) Blade clogging	A	A	A	A	A	A
(5) Shape retention	A	A	C	C	C	A

R marks:

- \*1: CARBOPOL 940, trade name; available from B.F. Goodrich
- \*2: ALKOX E-100 (number average molecular weight: 2,500,000-3,000,000), trade name; available from Meisei Chemical Works, Ltd.
- \*3: PEG-600 (number average molecular weight: 570-630), trade name; available from Sun Chemical Co., Ltd.

Table 2

Components	Comparative Example				(wt.%)
	5	6	7	8	
Carboxyvinyl polymer*1	0.70	6.00	0.05	0.70	
High-polymeric polyethylene oxide*2	2.50	0.30	0.030	0.002	
Aqueous 48% NaOH solution	0.43	1.84	0.03	0.43	
Purified water	96.37	91.86	99.62	98.87	
Total:	100.00	100.00	100.00	100.00	
<hr/>					
Evaluation					
(1) Razor slipperiness	A	B	A	B	
(2) Rash	A	A	A	B	
(3) Rinsing performance	C	C	A	A	
(4) Blade clogging	C	C	A	A	
(5) Shape retention	A	A	C	A	

## Remarks:

\*1, \*2: As shown in Table 1.

As is seen from Tables 1 and 2, in the shaving composition of Example 1, the carboxyvinyl polymer (0.70% by weight) and the high-polymeric polyethylene oxide (0.30% by weight) are used in combination, and hence good results are obtained in respect of all evaluation items.

On the other hand, in the shaving composition of Comparative Example 1, the carboxyvinyl polymer is used in the same amount as in Example 1 but the high-polymeric polyethylene oxide is not used, and hence the shaving composition does not well adhere to the skin, showing unsatisfactory results in respect of "razor slipperiness" and "rash".

In Comparative Example 2, the high-polymeric polyethylene oxide is used in the same amount as in Example 1 but the carboxyvinyl polymer is not contained, resulting in a lower evaluation than Example 1 in respect of "shape retention" .

In Comparative Example 3, the carboxyvinyl polymer and the high-polymeric polyethylene oxide are not used and a polyethylene oxide having a number average molecular weight of 570 to 630 is used. Hence, unsatisfactory results are obtained in respect of "razor slipperiness", "rash" and "shape retention".

In Comparative Example 4, the carboxyvinyl



polymer is used in the same amount as in Example 1 but the high-polymeric polyethylene oxide is replaced with a polyethylene oxide having a number average molecular weight of 570 to 630. Hence, unsatisfactory results are obtained in respect of "razor slipperiness" and "rash".

In Comparative Example 5, the high-polymeric polyethylene oxide is contained in excess, and hence unsatisfactory results are obtained in respect of "blade clogging" and "rinsing performance".

In Comparative Example 6, the carboxyvinyl polymer is contained in excess, and hence unsatisfactory results are obtained in respect of "blade clogging" and "rinsing performance", also showing a low "razor slipperiness".

In Comparative Example 7, the carboxyvinyl polymer is contained in a too small amount, resulting in a low "shape retention".

In Comparative Example 8, the high-polymeric polyethylene oxide is contained in a too small amount, resulting in a low "razor slipperiness" and an undesirable "rash".

#### Examples 2 to 8

Non-foamable gel shaving compositions formulated as shown in Tables 3 and 4 were produced in the same

manner as in Example 1. The razor slipperiness, rash, blade clogging, shape retention and rinsing performance were also evaluated in the same manner as in Example 1. As the result, good results were obtained in respect of all evaluation items.

Examples 9 and 10

Non-foamable gel shaving compositions formulated as shown in Table 5 were produced in the same manner as in Example 1. The razor slipperiness, rash, blade clogging, shape retention and rinsing performance were also evaluated in the same manner as in Example 1. As the result, good results were obtained in respect of all evaluation items.

Table 3

Components	Example					
	2	3	4	5	6	(wt.%)
Carboxyvinyl polymer*1	0.70	0.70	0.50	0.50	0.70	
Aqueous 48% NaOH solution	0.43	0.43	0.31	0.31	0.43	
High-polymeric polyethylene oxide*2	0.30	0.30	0.10	-	0.05	
High-polymeric polyethylene oxide*4	-	-	-	0.10	-	
Polyethylene oxide*3	-	0.50	2.00	2.00	2.00	
Methyl benzoate	0.10	0.10	0.10	0.10	-	
Disodium edetate*5	0.10	0.10	0.10	0.10	0.10	
Dipotassium glycyrrhetinate	0.10	0.10	0.10	0.10	-	
Purified water	98.27	97.77	96.79	96.79	96.27	
Total:	100.00	100.00	100.00	100.00	100.00	

## Remarks:

\*1,\*2,\*3: As shown in Table 1.

\*4: ALKOX E-160 (number average molecular weight: 3,600,000-4,000,000), available from

Meisei Chemical Works, Ltd.

\*5: FROST DS, trade name; available from Dai-ichi Chemical Industries, Ltd.

Table 4

Components	(wt.%)		
	Example		
	7	8	9
Carboxyvinyl polymer*1	0.60	0.70	0.50
Aqueous 48% NaOH solution	0.37	0.43	0.31
High-polymeric polyethylene oxide*2	0.10	0.10	0.10
Polyethylene oxide*6	1.00	-	-
Propylene glycol	-	2.00	-
Sorbitol	-	-	2.00
Methyl benzoate	0.10	0.10	0.10
Sodium edetate*5	0.10	0.10	0.10
Dipotassium glycyrrhetinate	0.10	0.10	0.10
Purified water	97.63	96.47	96.47
Total:	100.00	100.00	100.00

## Remarks:

\*1,\*2,\*5: As shown in Tables 1 and 3.

\*6: PEG-2000 (number average molecular weight: 1,900-2,100), trade name; available from

Sanyo Chemical Industries, Ltd.

Table 5

Components	(wt.%)	
	Example	
	10	11
Copolymer of acrylic acid and alkyl methacrylate*7	0.70	0.70
Aqueous 48% NaOH solution	0.43	0.43
High-polymeric polyethylene oxide*2	0.10	0.10
Sorbitol	-	3.00
Methyl benzoate	0.10	0.10
Disodium edetate*5	0.10	-
Dipotassium glycyrrhetinate	0.10	0.10
Purified water	98.47	95.67
Total:	100.00	100.00

## Remarks:

\*1, \*2, \*5: As shown in Tables 1 and 3.

\*7: PEMULEN TR-2, trade name; available from B.F. Goodrich

As is clear from the foregoing Examples, the non-foamable gel shaving composition of the present invention has a good shape retention, and also can well soften the mustache or skin. It also has a superior razor slipperiness, does not cause a rash, and makes it possible to shave several times at the same area of the skin. It still also does not cause the double-blade razor to clog, can be readily rinsed away, and can impart a good feel to users after washing.

~~The entire disclosure of Japanese Patent Application No.8-215243 filed on July 26, 1996 is incorporated by reference in its entirety.~~

Claims:

1. An aqueous non-foamable gel shaving composition comprising:

(A) 0.1-5.0% by weight of a carboxyvinyl polymer or a copolymer of acrylic acid and alkyl methacrylate; and

(B) 0.005-2.0% by weight of a polymeric polyethylene oxide having a number average molecular weight of 100,000 or more;

the relative amounts of (A) and (B) being based upon the composition as a whole.

2. An aqueous non-foamable gel shaving composition according to Claim 1, wherein the component (A) is a carboxyvinyl polymer having a structure represented by Formula (1):



wherein n is a number of from 5,000 to 60,000.

3. An aqueous non-foamable gel shaving composition according to Claim 1, wherein the component (A) is a copolymer of acrylic acid and alkyl methacrylate having a structure represented by Formula (2):



wherein R is an alkyl group having 8 to 30 carbon atoms; and n and m are each independently a number of from 1,000 to 60,000.

4. An aqueous non-foamable gel shaving composition according to any preceding Claim, wherein the polymeric polyethylene oxide forming the component (B) has a number average molecular weight of 2,000,000 to 4,000,000.

5. An aqueous non-foamable gel shaving composition according to any preceding Claim, comprising 0.2-1.0% by weight of the component (A) and 0.01-0.5% by weight of the component (B).

6. An aqueous non-foamable gel shaving composition according to any preceding Claim, which has a Brookfield viscosity (30°C) of 1,000-70,000 centipoises.

7. An aqueous non-foamable gel shaving composition according to Claim 6, which has a Brookfield viscosity (30°C) of 10,000-40,000 centipoises.

8. An aqueous non-foamable gel shaving composition according to any preceding Claim, which further comprises 0.01-5.0% by weight, based upon the composition as a whole, of a polyhydric alcohol.

9. An aqueous non-foamable gel shaving composition according to Claim 8, wherein said polyhydric alcohol is at least one of sorbitol, glycerol, propylene glycol, 1,3-



butylene glycol, diglycerol, dipropylene glycol, polypropylene glycol, and a polyethylene oxide having a molecular weight of less than 100,000.

10. An aqueous non-foamable gel shaving composition according to any preceding Claim, which further contains at least one of a nonionic surfactant, an anionic surfactant and an amphoteric surfactant.

11. An aqueous non-foamable gel shaving composition according to any preceding Claim, which does not contain a soap.

12. An aqueous non-foamable gel shaving composition according to any preceding Claim, which comprises at least 80% by weight of water.

13. An aqueous non-foamable gel shaving composition substantially as described herein with reference to any of Examples 1-11.



Application No: GB 9715561.8  
Claims searched: 1 to 13

Examiner: Michael Conlon  
Date of search: 5 November 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK CI (Ed.O): C5D (DAD)  
Int CI (Ed.6): A61K 7/15, C11D 17/00  
Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage		Relevant to claims
X	GB2271778 A	(Smartshave) page 5 line 13 to page 6 line 4	1 at least
X	GB2236760 A	(Inverness) page 4 line 12, page 6 lines 15 to 20	1 at least
A	GB2167429 A	(Robertson)	1
X	WO91/04729 A1	(Mackles) Example 3	1 at least
X	US3314857	(Fainer) column 2 lines 31 to 48	1 at least
X	DE19646233 A1	(Kao Corp) page 3 lines 27, 63, page 4 line 2ff, Examples 6, 7, 10	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.